05829

Kinetics of the Attachment of Mineral Particles to Bubbles During Flotation. I. The Electric Field of the Moving Bubble SOV/76-33-10-27/45

freely. The effect of the electric field exceeds the ion sheaths of the electric double layer and affects the approach of the mineral particles toward the moving particles in flotation. There are 9 Soviet references.

ASSOCIATION: Kavkazskiy institut mineral'nogo syr'ya (Caucasus Institute for Mineral Raw Materials)

SUBMITTED: March 26, 1958

Card 2/2

5(

S/069/60/022/01/022/025
D034/D003

AUTHOR: Dukhin, S.S.

TITLE: The Theory of the Drift of Aerosol Particles in Standing Sonic Waves

PERIODICAL: Kolloidnyy zhurnal, 1960, Vol XXII, Nr 1, pp 128-130 (USSR)

ABSTRACT: The author proposes a new mechanism for the drift of aerosol particles in a standing sound wave, leading to their periodic distribution, and also presents a theoretical discussion of this mechanism. He considers the case of smallest particles, the vibratory movement of which with regard to the medium is characterized by the Reynolds number below unit, and presents a formula (2) describing particle movement in a quickly oscillating field, which permits use of the method of P.L. Kapitsa [Ref. 4]. The case considered by the author involves

APPROVED FOR RELEASE: Thursday, July 27, 2000 CIA-RDP86-00513R00041151(

S/069/60/022/01/022/025
D034/D003

The Theory of the Drift of Aerosol Particles in Standing Sonic Waves

the fact that the sound wave acts on the particle prevalently by means of viscous forces. In order to prevent precipitation of the particles under gravity, it will be suitable to direct the sound beam vertically. In this case the stationary distribution of the particles close to node strength, resulting after a period of the order θ, will be determined by the condition of compensation of the weight of the particle by the force $F(x_0)$, $mg = F(x_0)$. It follows therefrom, for instance, that in the case of $\lambda = 3$ cm and $\Omega = 100$ erg/cm^3 the particles with a radius $r < 1 \mu$ distribute themselves within the interval $\Delta x \sim 3 \cdot 10^{-2}$ cm, near the node. There are 4 references, 3 of which are Soviet and 1 English.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii AN USSR, Kiyev (Institute of General and Inorganic Chemistry of the

S/069/60/022/01/022/025
D034/D003

The Theory of the Drift of Aerosol Particles in Standing Sonic Waves

AS Ukrainskaya SSR, Kiyev)

SUBMITTED: October 15, 1959

Card 3/3

84276

S/069/60/022/005/007/011
B015/B064

9.3010 (1031,1143,1331)
26.1420

AUTHORS: Dukhin, S. S. and Deryagin, B. V.

TITLE: The Electric Field of a Moving Uncharged Drop. 2. The Theory of the Electric Field of a Drop Containing a Non-ionogenic Surface-active Substance

PERIODICAL: Kolloidnyy zhurnal, 1960, Vol. 22, No. 5, pp. 587-592

TEXT: In continuation of a previous paper (Ref. 1), the author shows that an electric field is generated by the motion of the drop surface even in the absence of ions, if the drop contains a non-ionogenic surface-active substance. The present paper was read at the IV Vsesoyuznaya konferentsiya po kolloidnoy khimii (IV All-Union Conference on Colloidal Chemistry) at Tbilisi in 1957. The mechanism of the effect investigated is simple. The electric double layer caused by the dipoles of the adsorbed molecules has a spherically-symmetric form in the drop at rest; thus, no electric field is present outside the layer. Spherical symmetry is disturbed by the motion of the drop surface, which, in accordance with the laws of electrostatics, leads to the generation of an electric field.

Card 1/2

84276

The Electric Field of a Moving Uncharged Drop. 2. The Theory of the Electric Field of a Drop Containing a Non-ionogenic Surface-active Substance

S/069/60/022/005/007/011
B015/B064

This holds for the steady motion of a drop, which is considered here assuming a falling drop in an ion-free gas, whose motion is characterized by Re $\ll$ 1. An equation (4) is derived for the potential difference at both sides of the drop surface. Two limiting cases are studied: 1) The rate of access of the molecules to the drop surface is determined by the rate of the adsorption - desorption process; 2) the exchange rate of the surface-active substance is determined by a low rate of access of the substance from the interior of the drop to the surface, i.e., by the rate of convective diffusion. In a two-phase adsorption film, the voltage of the electric field may be several thousand volts/cm, while in single-phase films it is some orders of magnitude lower. There are 4 Soviet references.

ASSOCIATION: Institut fizicheskoy khimii AN SSSR Moskva (Institute of Physical Chemistry of the AS USSR Moscow)

SUBMITTED: December 2, 1959

Card 2/2

DERYAGIN, B.V.; DUKHIN, S.S.; LISICHENKO, V.A. (Moscow)

Kinetics of the attachment of mineral particles to bubbles in flotation. Part 2. Zhur. fiz. khim. 34 no.3:524-529 Mr '60.
(MIRA 13:11)

1. Kavkazskiy institut mineral'nogo syr'ya.
(Flotation) (Bubbles)

DUKHIN, S.S. (Khar'kov)

Kinetics of the attachment of mineral particles to air bubbles in flotation. Part 3: Secondary electrical double layer near the moving surface of a bubble. Zhur.fiz.khim. 34 no.5:1053-1059 My '60. (MIRA 13:7)

1. Kavkazskiy institut mineral'nogo syr'ya.
(Flotation)
(Electric charge and distribution)

DUKHIN, S.S.; DERYAGIN, B.V.

Electric field of a moving, uncharged drop. Part 2: Theory of the electric field of a drop containing a nonionogenic surface active substance. Koll. zhur. 22 no. 5:587-592 S-O '60. (MIRA 13:10)

1. Institut fizicheskoy khimii AN SSSR, Moskva.
(Drops) (Electric fields)

DUKHIN, S.S.

PHASE I BOOK EXPLOITATION SOV/5590

Konferentsiya po poverkhnostnym silam. Moscow, 1960.

Issledovaniya v oblasti poverkhnostnykh sil; sbornik dokladov na konferentsii po poverkhnostnym silam, aprel' 1960 g. (Studies in the Field of Surface Forces; Collection of Reports of the Conference on Surface Forces, Held in April 1960) Moscow, Izd-vo AN SSSR, 1961. 231 p. Errata printed on the inside of back cover. 2500 copies printed.

Sponsoring Agency: Institut fizicheskoy khimii Akademii nauk SSSR.

Resp. Ed.: B. V. Deryagin, Corresponding Member, Academy of Sciences USSR; Editorial Board: N. N. Zakhavayeva, N. A. Krotova, M. M. Kusakov, S. V. Norpin, P. S. Prokhorov, M. V. Talayev and G. I. Fuks; Ed. of Publishing House: A. L. Bankvitser; Tech. Ed.: Yu. V. Rylina.

PURPOSE: This book is intended for physical chemists.

Card 1/8

42

Studies in the Field of Surface Forces (Cont.) SOV/5590

COVERAGE: This is a collection of 25 articles in physical chemistry on problems of surface phenomena investigated at or in association with the Laboratory of Surface Phenomena of the Institute of Physical Chemistry of the Academy of Sciences USSR. The first article provides a detailed chronological account of the Laboratory's work from the day of its establishment in 1935 to the present time. The remaining articles discuss general surface force problems, polymer adhesion, surface forces in thin liquid layers, surface phenomena in dispersed systems, and surface forces in aerosols. Names of scientists who have been or are now associated with the Laboratory of Surface Phenomena are listed with references to their past and present associations. Each article is accompanied by references.

TABLE OF CONTENTS:

Card 2/8

I. GENERAL PROBLEMS OF SURFACE FORCES

II. POLYMER ADHESION

4

Card 7/8

29921
S/594/61/000/000/010/011
D234/D303

11.7350

AUTHORS: Buykov, M.V. and Dukhin, S.S.

TITLE: Theory of thermal and diffusional relaxation of an evaporating drop

SOURCE: Soveshchaniye po teplo- i massoobmenu. Minsk, 1961. Tezisy dokladov i soobshcheniy (Dopolneniye), 44-45

TEXT: Non-stationary evaporation or growth of a drop at rest (or in motion, but with small Pekle [Abstracter's note: Name transliterated] numbers) is considered, thermal processes being taken into account. The system of equations describing the process of evaporation consists of a diffusion equation for the density of vapor, a heat conduction equation for the regions outside and inside the drop. The boundary conditions are: Continuity of temperature, saturation of vapor and a thermal balance equation on the surface of the drop. At large distances from the drop the vapor density and temperature are supposed to be constant. All equations and boundary Peclet

Card 1/3

conditions, except that of thermal balance, are found to be satisfied after the introduction of new unknown functions and Duhamel's integral. The thermal balance equation is one for determining the temperature of the surface of the drop. In case of small subsaturations this equation can be linearized, and is then easily solved by applying the Laplace transformation. The analysis of the solution obtained leads to the following conclusions: If the quantity of heat absorbed in the phase transition at the surface of the drop is sufficiently small, the evaporation is quasi-stationary for $t \gg r_0^2/\varkappa_2$ (r_0 being the radius of the drop and $\varkappa_2$ the temperature conductivity of the substance of the drop) and then the field of vapor density near the drop corresponds always to the instantaneous temperature of the surface of the drop. Since the heat conductivity of air is small, the time interval during which the evaporation is quasi-stationary is found to be rather large. If the quantity of absorbed heat is large, the transition from non-stationary regime to the stationary is essentially non-stationary. [Abstracter's

29921
S/594/61/000/000/010/011
D234/D303

Theory of thermal...

note: Complete translation_7

ASSOCIATION: IONKh AN USSR (IONKh AS UkrSSR)

Card 3/3

APPROVED FOR RELEASE: Thursday, July 27, 2000 CIA-RDP86-00513R00041151(

S/069/61/023/001/004/009
B020/B056

AUTHORS: Deryagin, B. V., Dukhin, S. S., and Korotkova, A. A.

TITLE: Diffusiophoresis in electrolyte solutions and its role in the mechanism of film formation from rubber latices by the method of ion deposition

PERIODICAL: Kolloidnyy zhurnal, v. 23, no. 1, 1961, 53-58

TEXT: The equation for the diffusiophoresis in a non-electrolyte solution (Ref. 1), obtained by simple generalization, is transformed for the case of an electrolyte in the form

$$v^D = \left[(z^- \zeta^+ + z^+ \zeta^-)/\eta\right] \text{c degree } \mu \approx \left[(z^- \zeta^+ + z^+ \zeta^-)/\eta\right] \text{RT degree c} \quad (1),$$

where η is the viscosity, c is the molecular concentration of the electrolyte, $c = c^+/z^- = c^-/z^+$, μ is the chemical potential; R is the universal gas constant, T - absolute temperature, z^+ and z^- are the electrovalences of the ions:

$$\zeta^+ = (1/c_0^+) \int_0^\infty \gamma^+ h dh, \quad \zeta^- = (1/c^-) \int_0^\infty \gamma^- h dh,$$

Card 1/6

and γ^- the excess value of the concentration of cations and anions at the distance h from the sliding plane compared to the volume and c^+ and c^- the concentration of cations and anions, respectively, of the solution. The resulting rate of the diffusiophoresis of latex particles is

$$\vec{v} = \vec{v}_E + \vec{v}_D = (RT/\eta)\, D_{eff} \left[(z^- \zeta^+/D^+) + (z^+ \zeta^-/D^-) \right] \text{ degreec} \quad (5),$$

where $D_{eff} = \left[D^+D^-(z^+ + z^-)\right]/(z^+D^+ + z^-D^-)$ (D^+ and D^- are the diffusion coefficients of the positive and negative ions). In order to determine the distribution of an electrolyte diffusing from a flat fixator layer of thickness h into the semispace, the problem of non-steady diffusion of the electrolyte into the unbounded space from a 2h thick layer is dealt with. The functions $c'(x,t)$ and $c(x,t)$, (x is the distance from the symmetry plane which coincides with the central plane of the fixator layer; t is the time from the beginning of the process) are satisfied, besides by the equations

$$\partial c'/\partial t = D'_{eff}\, (\partial^2 c'/\partial x^2), \quad \partial c/\partial t = D_{eff}\, (\partial^2 c/\partial x^2),$$

where D'_{eff} is the diffusion coefficient of the electrolyte in the fixator,

Diffusiophoresis in electrolyte ... S/069/61/023/001/004/009
B020/B056

also by the intial and boundary conditions
$c'(x,t)|_{t=0} = c_0, c(x,t)_{t=0} = c_1$ (6) and $c'(x,t)|_{x=\pm h} = c(x,t)_{x=\pm h}$,
$D'_{eff}(\partial c'/\partial x)(x,t)_{x=\pm h} = D_{eff}(\partial c/\partial x)\cdot(x,t)_{x=\pm h}$ (7). When using the solution of the analogous heat problem concerning the solidification of the liquid layer, the relation

$$c(x,t) = c_0 + (c_1 - c_0)\frac{(D'_{eff}/D_{eff})^{1/2}}{1+(D'_{eff}/D_{eff})^{1/2}}\left[\mathrm{erfc}\frac{x-h}{2(D_{eff}t)^{1/2}} - (1-\varkappa)\sum_{n=1}^{\infty}(-\varkappa)^{n+1}\mathrm{erfc}\frac{x-h+2nh(D'_{eff}/D_{eff})^{1/2}}{2(D_{eff}t)^{1/2}}\right], \quad (8)$$

is obtained, where $\varkappa = \left[1 - (D'_{eff}/D_{eff})^{1/2}\right] / \left[1 + (D'_{eff}/D_{eff})\right]^{1/2}$
For the rate of diffusiophoresis, the equation

$$v(x,t) = \frac{dx}{dt} = -\frac{A}{2\sqrt{D_{eff}t}}\left[e^{-\frac{(x-h)^2}{4D_{eff}t}} - (1+\varkappa)\sum_{n=1}^{\infty}(\varkappa)^{n+1}e^{-\frac{[x-h+2nh(D'_{eff}/D_{eff})^{1/2}]^2}{4D_{eff}t}}\right], \quad (9)$$

Card 3/6

is obtained, where

$$A = \frac{2(c_0 - c_1) RT (D'_{eff} D_{eff})^{1/2} D_{eff}}{\sqrt{\pi}\,\eta\,[1 + (D'_{eff}/D_{eff})^{1/2}]} \left(\frac{z^+\zeta^+}{D^+} + \frac{z^+\zeta^-}{D^-}\right); \qquad (10)$$

A depends on c via ζ^+ and ζ^-. For the surface density $\Gamma(t)$ of the precipitated latex layer as dependent on time, the relation

$$\Gamma(t) = \rho_0 (x_0(t) - h) = \rho_0 4k_0 (D_{eff} t)^{1/2} = \frac{2\rho_0 RT}{\eta}\left(\frac{z^-\zeta^+}{D^+} + \frac{z^+\zeta^-}{D^-}\right)(c_0 - c_1)\frac{(D'_{eff} t)^{1/2}}{(\pi)^{1/2}[1 + (D'_{eff}/D_{eff})^{1/2}]}, \qquad (23)$$

is obtained, where c_1 is the initial concentration of the latex. Finally, relations are given for the rate of ion deposition $\Gamma(t)$ directly by means of the potential

APPROVED FOR RELEASE: Thursday, July 27, 2000 CIA-RDP86-00513R00041151(

$$\Gamma(t) = \frac{\rho_0 \varepsilon (c_0 - c_1)(kT)^2 (D'_{eff} t)^{1/2}}{\pi^{3/2} \eta c_0 z^2 e^2 [1 + (D'_{eff}/D_{eff})^{1/2}]} \left\{ \frac{\ln[1 + \exp(-ze\zeta/2kT)]/2}{D^+} + \right.$$

$$\left. + \frac{\ln[1 + \exp(ze\zeta/2kT)]/2}{D^-} \right\}, \quad (z^+ = z^- = z) \quad (A)$$

$$\Gamma(t) = \frac{\rho_0 \varepsilon \zeta kT (c_0 - c_1)(D^+ - D^-)(D'_{eff} t)^{1/2}}{2\pi^{3/2} \eta e c_0 (z^+ + z^-) D^+ D^- [1 + D'_{eff}/D_{eff})^{1/2}]}, \quad (|\zeta| < 25 \text{ мв})$$

$$\Gamma(t) = \frac{\varepsilon \rho_0 kT (c_0 - c_1) \zeta (D'_{eff} t)^{1/2}}{2\pi^{3/2} \eta e c_0 z^- D^- [1 + (D'_{eff}/D_{eff})^{1/2}]}, \quad (\zeta \gg 25 \text{ мв}) \quad (B)$$

$$\Gamma(t) = \frac{\varepsilon \rho_0 kT (c_0 - c_1) \zeta (D'_{eff} t)^{1/2}}{2\pi^{3/2} \eta e c_0 z^+ D^+ [1 + (D'_{eff}/D_{eff})^{1/2}]}, \quad (-\zeta \gg 25 \text{ мв}).$$

S/069/61/023/001/004/009
B020/B056

Diffusiophoresis in electrolyte ...

wherever this is possible. A. N. Frumkin is mentioned. There are 4 Soviet-bloc references.

ASSOCIATION: Institut fizicheskoy khimii AN SSSR, Moskva (Institute of Physical Chemistry of the AS USSR, Moscow)

SUBMITTED: July 12, 1960

DUKHIN, S.S.

Electrokinetic diffusion thinning of liquid films [with summary in English]. Koll.zhur. 23 no.4:408-417 Jl-Ag '61. (MIRA 14:8)

1. Kavkazskiy institut mineral'nogo syr'ya, Tbilisi.
(Films, Coefficients (Physics)) (Flotation)

S/076/61/035/006/005/013
B110/B220

AUTHORS: Dukhin, S. S. and Deryagin, B. V. (Moscow)

TITLE: Kinetics of mineral particle attachment to bubbles in flotation IV. Retardation by surface-active substances and distribution on the bubble

PERIODICAL: Zhurnal fizicheskoy khimii, v. 35, no. 6, 1961, 1246 - 1257

TEXT: When determining the surface mobility of bubbles and the distribution of flotation agents the retardation by the ionogenic adsorption layer of a surface-active substance has to be taken into account. Moreover, the retardation is important for calculating the Dorn effect and the bubble electrophoresis, for the determination of low concentrations, and after corresponding modification for Hg drops and polarography. According to V. G. Levich (Fiziko-khimicheskaya gidrodinamika (Physicochemical hydrodynamics), Izd-vo AN SSSR, M. 1952) $v_r^{(o)} = u_o(1-a^3/r^3)\cos\Theta$, $v_\Theta^{(o)} = u_o(1+a^3/r^3)\sin\Theta$ (1) holds for bubbles without surface-active substances in all liquids. For the tangential stress $\tau \left.\frac{\partial v_\Theta}{\partial r}\right|_{r=a} = 0.$ (2)

Card 1/9

the following equation holds: $\vec{v}(r,\theta) = \vec{v}^{(o)} + \vec{v}'$ (3), wherein $\vec{v}'$ = deviation from the velocity of the ideal liquid. The following condition is assumed: $|\vec{v}'| \ll |\vec{v}^{(o)}|$ (7). The tangential stress (2) is in equilibrium with the gradient of the surface tension in the presence of surface-active substances: $\eta \frac{\partial v_\theta}{\partial r}\Big|_{r=a} = \frac{1}{a}\frac{\partial \sigma}{\partial \theta}$ (8). (1), (2), and (8) result in:

$$\eta \frac{\partial v'_\theta}{\partial r}\Big|_{r=a} = \frac{1}{a}\frac{\partial \sigma}{\partial \Gamma}\frac{\partial \Gamma}{\partial \theta} + \frac{3}{2}\eta\frac{u_o}{a}\sin\theta \qquad (9).$$

If $v_\theta(a,\theta) = v_\theta^{(o)}(a,\theta) + v_\theta'(a,\theta)$,

$$v_\theta'(a,\theta) = \frac{3}{2}u_0\sin\theta + \frac{3}{4}\frac{u_0}{\sin\theta}\left(\frac{3}{\pi R_e}\right)^{1/2}\left(1 + \frac{2RT\delta\Gamma_0^2}{\eta a D c_0}\right)^{-1}\int_0^{1-\cos\theta}\frac{[1-(z-1)^2]^{1/2}dz}{[1-\cos\theta - z]^{1/2}} \qquad (13)$$

is obtained. $\Gamma_0/c_0 \ll \delta \sim 10^{-4}$ cm (14)

is assumed to be a condition for low surface activity,

$\Gamma_0/c_0 \gg \delta$ (15) for high surface activity.

Eq.

$$v'_\theta(a, \theta) = \frac{3}{2} u_0 \sin\theta + \frac{1}{\sin\theta \sqrt{6\pi \mathrm{Pe}}} \left[\frac{3}{2} u_0 J_1(\theta) + \frac{RT c_0 a}{\varkappa \sqrt{3\pi \mathrm{Pe}}} J_2(\theta) \right]. \quad (25)$$

holds for the velocity distribution, in the integrals: Eqs.

$$J_1(\theta) = \int_0^{1-\cos\theta} \frac{[1-(z-1)^2]^{1/2}}{[1-\cos\theta - z]^{1/2}} dz \quad (25a)$$

$$J_2(\theta) = \int_0^{1-\cos\theta} \frac{4-z}{(2-z)^{1/2}(1-\cos\theta - z)^{1/2}} \left(\frac{z}{3-z}\right)^{1/2} dz \quad (25b)$$

being calculated numerically (Figs. 1 and 2). The second component of (13) is the correction of the velocity distribution due to the existence of an adsorbed substance on the bubble surface. Figs. 1 and 2 show the steep rise of the retardation effect with increasing θ, i. e., on approaching the rear of the bubble. It has to be studied, whether the equations hold for this zone. With a velocity distribution according to Eq. (13) the retardation effect is low in: Eq.

$$K = \frac{2RT\Gamma_0}{\eta a D} \frac{\Gamma_0}{c_0} \delta < 1. \quad (27)$$

S/076/61/035/006/005/013
B110/B220

where K = relative decrease of velocity due to the retardation effected by the reagents in the rear zone, where $v'(a,\theta) \sim u_0 \sin\theta$. The concentrations satisfying (27) have but a slight influence on the position of the shedding, which is determined by $v'_\theta(a,\theta) \sim u_0 \sin\theta$ (28). Their velocity distribution is nearly that of an ideal liquid circulating around a solid sphere and the surfactants have practically no influence on the hydrodynamic properties of the bubble. The influence of the reagents on the point of shedding begins at "critical" concentrations satisfying $K(c_0) \sim 1$ (29). Retardation outside the rear zone is slight as long as $K(c_0) \ll Re^{1/2}$ (30). (13) and (28) do not hold for $\theta > \theta_1$. For $\theta \sim \theta_1$ and somewhat lower θ values (13) does not hold, since (7) is not satisfied. (28) holds the better, the nearer $\theta = \pi$. If (30) is satisfied, (28) holds. The part of the bubble surface, where intense retardation at $\theta \simeq \theta_1$ changes into a slight one at $\theta \lesssim \theta_1 - \Delta\theta$, is situated above the zone of shedding. For θ_1 near π satisfying condition (30): $\Delta\theta \ll \theta_1$. For concentrations satisfying (30) θ_1 and the narrow transition range ($\Delta\theta \ll \theta_1$) may be indicated approximately and the

Card 4/9

retardation may be neglected in the main zone of the bubble ($\theta < \theta_1 - \Delta\theta$). With increasing concentrations the shedding is moved to the equator, the transition zone expands and the zone of low tension disappears. For $Da \sim 10^{-7}$ cm^3/sec, $\Gamma_0 / c_0 \sim 3 \cdot 10^{-5}$ cm (according to (14)) and $\delta \sim 10^{-4}$ cm the concentration effecting the shift of the shedding line is $5 \cdot 10^{-4}$ gmole/l according to (29), which corresponds to the concentrations of xanthogenate used in industrial flotation. Since these correspond to (14), they have no retardation effect on the bubble surface. In the zone $\theta \sim \pi$, $J_2(\theta)$ grows more rapidly than $J_1(\theta)$. The comparison of the components of, (25) is only of use, if $\theta < \theta_{1p}$, where θ_{1p} = position of the shedding lines in pure liquid. The "critical" concentration, where a shift of the shedding lines begins, is:

$$c_{\kappa p} \sim \frac{9\pi\eta u_0^2}{(2\nu D)^{1/2} RT} \frac{\sin^3 \theta_{1p}}{J_2(\theta_{1p})}. \qquad (31)$$

With $c_0 > c_{kp}$ the shedding lines are shifted to the zone $\theta < \theta_{1p}$. Since in this case the first component of (25) is larger than the second,

$$\frac{J_2(\theta_1)}{\sin^3\theta_1} \sim \frac{9\pi u_0^3}{(2vD)^{1/2}}\frac{\eta}{RTc_0} \qquad (32a)$$

holds which after transformation has the form

$$\frac{J_2(\theta_1)}{J_2(\theta_{1p})}\frac{\sin^3\theta_{1p}}{\sin^3\theta_1} \sim \frac{c_{kp}}{c_0}. \qquad (33)$$

The bubble surface consists of: (A) shedding zone, (B) zone of transition, and (C) zone of slight retardation. Since (25) applies only for (C), it has to be defined more exactly: If (7) holds the retardation in (C) may be described by comparing the third and first components of (13) and (25). In case (14) it is $f_1(\theta) = J_1(\theta)/\sin^2\theta$, in case (15) $f_2(\theta) = J_2(\theta)/\sin^2\theta$ (Figs. 1 and 2). The difference between the two amounts to 4 powers of ten, e. g. for (14): $c_{kp} = 10^{-3}$gmole/l, for (15): $c_{kp} = 10^{-7}$gmole/l. In (14) the shedding line is shifted from the rear to the equator at concentrations from c_{kp} to $\sqrt{Re}\, c_{kp}$, i. e. for an increase in concentration by 1 power of ten. In (15) the increase in concentration must be 4 powers of ten. Since for Θ = 90-170° $f_2(\Theta)$ decreases more rapidly than $f_1(\Theta)$, with decreasing Θ the zone $\Theta < \Theta_1$ is less retarded in (15). For $0 < \Theta < 90°$ $f_2(\Theta)$ decreases slowly. Thus, the shift of the shedding line to the equator effects an intensive retardation also in the case of (15). For (14) the retardation process can be described quantitatively by (25) merely in the zone of slight retardation. Moreover, the vortex shedding from the rear zone has to be taken into account. So the velocity distribution on circulation around a sphere (Reynolds number = 157,000) is potential for $0 < \Theta < 50°$, but quite differing for $\Theta > 60°$. In the range of the Reynolds number of $5 \cdot 10^2 - 10^5$ the resistance of a solid sphere does not alter, which indicates inalterability of the shedding lines ($\Theta = 81°$, when $Re = 10^5$), since the resistance is determined by the shedding. If (7) is satisfied (13) and (25) hold at the most for $\Theta < 50°$, if the shedding lines at $\Theta > 135°$ are rather distant from the equator. If the shedding zone is small, the zone of the angles is large, where the velocity distribution differs but slightly from (1). There are 2 figures and 7 Soviet-bloc references.

Kinetics of mineral...

S/076/61/035/006/005/013
B110/B220

ASSOCIATION: Akademiya Nauk SSSR Institut fizicheskoy khimii (Academy of Sciences, USSR, Institute of Physical Chemistry), Kavkazskiy institut mineral'nogog syr'ya (Kavkaz Institute of Mineral Raw Material)

SUBMITTED: September 17, 1959

Card 8/9

DUKHIN, S.S.; DERYAGIN, B.V. (Moskva)

Kinetics of the attachment of mineral particles to bubbles in flotation. Part 5: Motion of the bubble surface considerably retarded by a dissolved surface active agent; distribution of the surface active substance and the electric field of the bubble. Zhur. fiz. khim. 35 no.7:1453-1457 Jl '61. (MIRA 14:7)

1. Kavkazskiy institut mineral'nogo syr'ya.
(Bubbles) (Surface chemistry)

DUKHIN, S. S.

"Investigation of phase transitions in scoper cooled fog by flow methods."
To be presented at the First National Conference on Aerosols - Liblice, Czechoslovakia, 8-13 Oct 1962

Inst. of Physical Chemistry, Acad. of Sci. USSR, Moscow (1959 position)

34344

S/170/62/005/003/007/012
B152/B102

11.7350

AUTHORS: Buykov, M. V., Dukhin, S. S.

TITLE: Diffusional and thermal relaxation of a vaporizing drop

PERIODICAL: Inzhenerno-fizicheskiy zhurnal, v. 5, no. 3, 1962, 80-87

TEXT: The non-steady growth or evaporation of an immobile drop is considered, and the relaxation times of the transition into the steady state are calculated. The fields of temperature and vapor density are determined for constant drop radius and equal temperatures of the drop and the surrounding. It is shown that the relaxation process may be quasi-steady, i.e. that variations of the fields of temperature and vapor density immediately follow variations of drop temperature. The equations of diffusion and heat conduction are:

$$\frac{\partial z}{\partial \tau} = a\nabla^2 z; \ \frac{\partial y_1}{\partial \tau} = \beta \nabla^2 y_1; \ \frac{\partial y_2}{\partial \tau} = \nabla^2 y_2; \qquad (1.a),$$

$$a = D/\varkappa_2; \ \beta = \varkappa_1/\varkappa_2,$$

Card 1/6

where $t = r_0\tau/\varkappa_2$; $r = xr_0$; $z(x,\tau) = (u_0 - u)/u_0$; $y_1(x,\tau) = (T_1 - T_0)/T_0$; $y_2(x,\tau) = (T_2 - T_0)T_0$. u - vapor density, T_1 and T_2 - temperatures outside and inside the drop, D - diffusion coefficient of the vapor in the surrounding gas, $\varkappa_1$ and $\varkappa_2$ - thermal diffusivity of the vapor gas mixture and the drop substance, r_0 - drop radius. The boundary and initial conditions are: $x \to \infty$ $y_1 \to 0$, $z \to 0$; and at $x = 1$

$$y_1 = y_2 = Y(\tau),\ z = Z_s[Y(\tau)],\ \Gamma_0 \frac{\partial z}{\partial x} - \frac{\partial y_1}{\partial x} + \gamma \frac{\partial y_2}{\partial x} = 0, \qquad (2.a);$$

$$\Gamma_0 = LDu_0/T_0k_1;\ \gamma = k_2/k_1; \qquad \text{and} \quad (3.a),$$

$$z = y_1 = y_2 = 0,\ \tau = 0.$$

where L - evaporation heat, u_0 - vapor density in the infinity, k_1, k_2 - heat conductivities of the vapor - gas mixture and the drop substance. When assuming that Y is small compared with unity and introducing

$$f(\tau) = \Gamma_0 S_0(\tau + 2\sqrt{\tau/\varkappa a}); \qquad (11),$$

$$S_0 = \frac{u_0 - u_S(T_0)}{u_0};$$

Card 2/6

$$Z_S(Y) = S_0 - \frac{u_S(T_0)}{u_0}\left(\frac{E}{T_0} - 1\right)Y; \qquad (11.a),$$

$$K(\theta) = 1 + \Gamma + \frac{1 + \Gamma\sqrt{\beta/\alpha}}{\sqrt{\pi\beta\theta}} + 2\gamma\sum_{n=1}^{\infty}\exp[-\lambda_n^2\theta],$$

$$\Gamma = \Gamma_0 \frac{u_S(T_0)}{u_0}\left(\frac{E}{T_0} - 1\right) \qquad (12),$$

where E = $L\mu/R$, R - gas constant, μ - atomic number of the vapor, $\lambda_n = \pi n$

$$Y(\tau) = Y_\infty\left[1 + \exp\left(-\frac{\tau}{\tau_0}\right) + \sum_{k=1}^{\infty} A_k \exp\left(-\frac{\tau}{\tau_k}\right) + \right. \qquad (15)$$

X

$$+\int_0^{\pi} ds \exp(-s^2\tau)\varphi(s)\Big],$$

$$Y_\infty = \frac{\Gamma_0 S_0}{1+\Gamma};\ \tau_0 = \frac{\gamma}{3(1+\Gamma)} \gg 1;$$

$$\varphi(s) = \frac{2(1+\Gamma)}{\pi} \frac{\left[1-\sqrt{\frac{\beta}{\alpha}}(2+\Gamma)\right]\beta^{-1/2} - \frac{2\gamma}{\sqrt{\alpha}}(1-s\operatorname{ctg}s)}{(1+\Gamma-\gamma+\gamma s\operatorname{ctg}s)^2+\left(1+\Gamma\sqrt{\frac{\beta}{\alpha}}\right)^2\beta^{-1}s^2}$$

is obtained. For $\tau \gg 1$ is obtained

$$Y(\tau) \cong Y_\infty\left[1+\exp\left(-\frac{\tau}{\tau_0}\right)\right] \qquad (20),$$

$$Y(\tau) \cong Y_\infty\left[1+\exp\left(-\frac{\tau}{\tau_0}\right)+\frac{\varphi(0)}{2}\sqrt{\frac{\pi}{\tau}}\right] \qquad (18),$$

Card 4/6

Diffusional and thermal relaxation ... S/170/62/005/003/007/012
B152/B102

where

$$\varphi(0) = \frac{1 - \sqrt{\beta/\pi}(2+\Gamma)}{\sqrt{\beta}(1+\Gamma)}.$$

since

$$\tau_0 > \tau \gg \tau_1 = \frac{\pi}{4}\varphi^2(0), \qquad (19).$$

In this approximation $y_2(x,\tau) \doteq Y(\tau)$, i.e. the temperatures inside the drop and on its surface are equal. For $\Gamma \gg \gamma$ and $\tau \gg 1$

$$Y(\tau) = Y_\infty\left[1 + \frac{\varphi(0)}{2}\sqrt{\frac{\pi}{\tau}}\right] \qquad (25),$$

i.e. the temperature on the drop surface does not depend on time, and evaporation is steady. For $E \gg T_0$, $\Gamma/\gamma = E(dQ/dt)_{ev}/T_0/(dQ/dt)_{hc}$ where $(dQ/dt)_{ev} = LDu_s(T_0)/r_0^2$; $(dQ/dt)_{hc} = k_2T_0/r_0^2$. If $\Gamma \ll \gamma$, quasi-steady fields of diffusion and temperature can establish since the thermal diffusivity of the gases is greater than that of a fluid. Therefore, the period of

Card 5/6

X

Diffusional and thermal relaxation ... S/170/62/005/003/007/012 B152/B102

time required for establishing the quasi-steady state outside the drop is shorter than inside. Stationary flow begins at $\tau \gg \tau_0$ and in this case the temperature of the drop equals the psychrometric one. When $\Gamma \gg \gamma$, a quasi-steady state is impossible since the heat absorbed during phase transition is greater than the heat supplied by heat conduction. At $\tau \gg \tau_1$ (and $\Gamma \ll \gamma$) evaporation becomes steady. In this case, the total relaxation time is less than in the above case because large gradients of temperature and vapor density will arise. Also when $\Gamma \sim \gamma$, no quasi-steady states occur. There are 7 references: 6 Soviet and 1 non-Soviet.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii AN USSR, g. Kiyev (Institute of General and Inorganic Chemistry AS UkrSSR, Kiyev)

SUBMITTED: November 28, 1961

Card 6/6

S/069/62/024/006/004/009
B101/B180

AUTHORS: Dukhin, S. S., Dekhtyar, M. I.

TITLE: The role of thermophoretic and diffusive forces in the generation of ice crystals near cold surfaces. I. Thermophoretic sedimentation of ice crystals generated near a cold semi-infinite plate

PERIODICAL: Kolloidnyy zhurnal, v. 24, no. 6, 1962, 674-677

TEXT: The effect of thermophoresis on the motion of ice crystals is calculated for a semi-infinite plate parallel to x the direction of the air flow. The path of the ice crystals is given by $y^2/b^2 + (\sqrt{x} - a)^2/a^2 = 1$. For the semi-axes a and b of the ellipse $a = C/2\gamma$ and $b = C/2\sqrt{\gamma}$, where $\gamma = (16\varkappa/30\mu)(k/8\varkappa m)^{1/2}\lambda T_1^{-1/2}$, $\mu = 8 - 10$, k is the Boltzmann constant, m the mean molecular weight of the air, λ the mean free path of the air molecules, T_1 the surface temperature, and C is an integration constant. The velocity distribution is given by

Card 1/3

The role of thermophoretic and ... S/069/62/024/006/004/009 B101/B180

$\eta = (uy^2/4\nu x)^{1/2}$, where u is the influx velocity of air, and the kinetic viscosity of the gas. The resulting graph shows that all the ice crystals appear on the plate at $\eta = 1.1$ and u = 30 m/sec. It is noted that near the surface of dry ice and of non-evaporating solids, ice crystals form under different conditions, since occurs in the former case diffusion phoresis. There is 1 figure. The most important English-language reference is: C. Shadt, R. Cadle, J. Colloid Sci., 12, 356, 1957.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii AN USSR, Kiyev (Institute of General and Inorganic Chemistry of the AS UkrSSR, Kiyev)

SUBMITTED: September 14, 1961

Figure.

Card 2/3

The role of thermophoretic and ... S/069/62/024/006/004/009
B101/B180

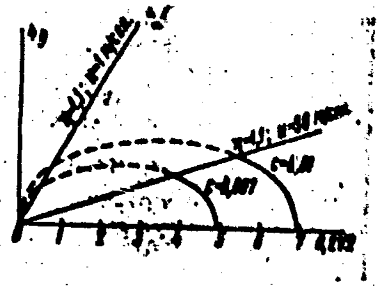

Fig.

Card 3/3

43804

S/069/62/024/006/009/009
B101/B180

26 1420

17

AUTHORS: Shulepov, Yu. V., Dukhin, S. S.

TITLE: Theory of electrical coagulation of spherical aerosol particles

PERIODICAL: Kolloidnyy zhurnal, v. 24, no. 6, 1962, 749-751

TEXT: The capture efficiency E of one aerosol particle by another is calculated from the general equations $m_1 d\vec{v}_1/dt = \vec{F}_1 + m_1 g\vec{\xi} + \vec{F}_{12e}$ and $m_2 d\vec{v}_2/dt = \vec{F}_2 + m_2 g\vec{\xi} - \vec{F}_{12e}$, where $m_1 = (4/3)\pi R_1^3\rho$ and $m_2 = (4/3)\pi R_2^3\rho$ are the masses of the first and the second particle, respectively; ρ is the particle density, R_1 and R_2 the radii; g is gravitational acceleration; $\vec{\xi}$ is the vertical unit vector; F_{12e} is the force of electrical interaction between the particles; $\vec{v}_1$ and $\vec{v}_2$ are the velocity vectors of the first and second particle, respectively; t is the time; F_1 and F_2 are the forces

Card 1/3

which, owing to the viscosity of the medium, act on particles 1 and 2. Attempts by L. M. Levin and R. Cochet (L. M. Levin, Dokl. AN SSSR, 94, no. 3, 1954; R. Cochet, Ann. geophys., 8, 33, 1952) to solve the above set of equations are discussed. It is shown that solutions can be obtained for any ratio of the particle radii, R_2/R_1, using the following set of equations: $6\pi\eta R_1 dx_1/dt = K(x_2 - x_1)/\left[(x_1 - x_2)^2 + (y_1 - y_2)^2\right]^3$;

$6\pi\eta R_1 dy_1/dt = m_1 g + K(y_2 - y_1)/\left[(x_1 - x_2)^2 + (y_1 - y_2)^2\right]^3$;

$6\pi\eta R_2 dx_2/dt = -K(x_2 - x_1)/\left[(x_1 - x_2)^2 + (y_1 - y_2)^2\right]^3$;

$6\pi\eta R_2 dy_2/dt = m_2 g - K(y_2 - y_1)/\left[(x_1 - x_2)^2 + (y_1 - y_2)^2\right]^3$; here,

$K = 2Q_1^2 R_2^3$, and Q_1 is the electrical charge of the first particle. When the larger particle is charged and the smaller one uncharged, the capture efficiency is given by $E_2 = (45/16g\mu)^{2/5} Q_1^{4/5} R_2^{4/5} / R_1^{12/5} (R_1 - R_2)^{2/5}$, but

Card 2/3

Theory of electrical coagulation of ... S/069/62/024/006/009/009
B101/B180

when the smaller one or both the particles are charged, then
$E_3 = (45/16g\nu)^{2/5} Q_2^{4/5} R_1^{-6/5} R_2^{-2/5} (R_1 - R_2)^{-2/5}$; $E_1 = 3Q_1Q_2/\varkappa g R_1^3 (R_1 - R_2) R_2$.
The known formulas, derived on the basis of the elementary act of electrical coagulation as a one-body problem, are particular cases of the formulas derived here. There is 1 figure.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii AN USSR, Kiyev (Institute of General and Inorganic Chemistry of the AS UkrSSR, Kiyev)

SUBMITTED: May 18, 1961

Card 3/3

APPROVED FOR RELEASE: Thursday, July 27, 2000 CIA-RDP86-00513R00041151(

APPROVED FOR RELEASE: Thursday, July 27, 2000 CIA-RDP86-00513R00041151(

SHULEPOV, Yu. V.; DUKHIN, S. S.

Theory of electrical coagulation of spherical aerosol particles.
Koll. zhur. 24 no.6:749-751 N-D '62. (MIRA 16:1)

1. Institut obshchey i neorganicheskoy khimii AN UkrSSR, Kiyev.

(Colloids) (Coagulation)

- BUYKOV, M.V.; DEKHTYAR, M.I.; DUKHIN, S.S.

Theory of the large drop part of the spectrum of cloud drops. Izv.AN SSSR.Ser.geofiz. no.4:637-647 Ap '63. (MIRA 16:4)

1. Institut obshchey i neorganicheskoy khimii AN UkrSSR. (Clouds—Spectra)

the Dorn potential on the movement in a double electric layer.

APPROVED FOR RELEASE: Thursday, July 27, 2000 CIA-RDP86-00513R00041151(

APPROVED FOR RELEASE: Thursday, July 27, 2000 CIA-RDP86-00513R00041151(

DUKHIN, S.S.

Diffusion-electric theory of the Dorn effect. Part 2: Effect of surface diffusion and electric conductivity on the electric field for Peclet numbers much smaller than unity. Koll.zhur. 25 no.5:520-523 S-O '63.

Diffusion-electric theory of the Dorn effect. Part 3: Method for calculating the far-range electric field for large Peclet numbers. 524-532 (MIRA 16:10)

1. Institut obshchey i neorganicheskoy khimii AN UkrSSR, Kiyev.

DUKHIN, S.S.

Diffusion-electrical theory of the Dorn effect. Part 4: Calculation of the electric field for Pe $\gg 1$ and Re < 1 in the case of a weak surface inhibition. Koll.zhur. 26 no.1:36-44 Ja-F '64. (MIRA 17:4)

1. Institut obshchey i neorganicheskoy khimii AN UkrSSR, Kiyev.

DUKHIN, S.S.; ORLOV, V.N.; PEREKUPKA, I.A.; ZAYTSEVA, K.A.

Flow methods for the determination of sizes and charges of coarse aerosol particles. Koll.zhur. 26 no.1:133-138 Ja-F '64. (MIRA 17:4)

1. Institut obshchey i neorganicheskoy khimii AN UkrSSR, Kiyev.

SAMYGIN, V.D.; DERYAGIN, B.V.; DUKHIN, S.S.

)

Study of the Dorn effect on air bubbles. Koll. zhur. 26 no.4:493-501 Jl-Ag '64. (MIRA 17:9)

1. Institut fizicheskoy khimii AN SSSR, Nauchno-issledovatel'skiy institut tsvetnykh metallov i Institut obshchey i neorganicheskoy khimii AN UkrSSR.

DUKHIN, S.S.; BEREZHNAYA, I.N.; SOLYANEK, Ye.G.; PEREKUPKA, I.A.

Role of thermophoretic and diffusion forces in the generation of ice crystals near cold surfaces. Part 2: Theoretical evaluation and experimental measurements of the yield of crystals generated near a spherical dry ice granule and a metallic sphere as dependent on the temperature of their surfaces. Koll. zhur. 26 no.6:662-669
N-D '64 (MIRA 18:1)

1. Ukrainskiy nauchno-issledovatel'skiy gidrometeorologicheskiy institut, Kiyev.

DUKHIN, S.S.; BUYKOV, M.V.

Theory of the dynamic adsorption layer of moving spherical particles. Part 1: Dynamic adsorption layer of a solid spherical particle with Reynolds number $Re \ll 1$ and Peclet number $Pe \gg 1$. Zhur. fiz. khim. 38 no.12:3011-3013 D '64. (MIRA 18:2)

1. Institut obshchey i neorganicheskoy khimii AN UkrSSR.

DUKHIN, S.S.; DERYAGIN, B.V.

Thermodynamics of irreversible processes as applied to the theory of capillary osmosis and diffusion phoresis. Dokl. AN SSSR 159 no.2:401-404 N '64. (MIRA 17:12)

1. Laboratoriya poverkhnostnykh yavleniy instituta fizicheskoy khimii AN SSSR i Institut obshchey i neorganicheskoy khimii AN UkrSSR. 2. Chlen-korrespondent AN SSSR (for Deryagin).

DUKHIN, S.S.; DERYAGIN, B.V.

Application of the thermodynamics of irreversible processes to the theory of electroosmosis, electrophoresis, capillary osmosis, anddiffusion phoresis in electrolytes. Dokl. AN SSSR 159 no.3:636-639 N '64 (MIRA 18:1)

1. Institut fizicheskoy khimii AN SSSR i Institut obshchey i neorganicheskoy khimii AN UkrSSR. 2. Chlen-korrespondent AN SSSR (for Deryagin).

LYASHEV, K.F.; DUKHIN, S.S.; DERYAGIN, B.V.

Effect of adsorption layers of soluble surface-active agents on the evaporation rate of fine water droplets. Koll. zhur. 27 no.1:64-69 Ja-F '65. (MIRA 18:3)

1. Institut obshchey i neorganicheskoy khimii AN UkrSSR, Kiyev i Institut fizicheskoy khimii AN SSSR, Moskva.

L 35390-66 EWT(m)/T IJP(c) DS/WW

ACC NR: AP6026841 SOURCE CODE: UR/0069/66/028/001/0155/0157

52
B

AUTHOR: Lyashev, K. F.; Dukhin, S. S.; Deryagin, B. V.

ORG: Institute of General and Inorganic Chemistry, AN UkrSSR, Kiev (Institut obshchey i neorganicheskoy khimii AN UkrSSR)

TITLE: Effect of soluble surface-active substances on the rate of evaporation of fine water droplets

SOURCE: Kolloidnyy zhurnal, v. 28, no. 1, 1966, 155-157

TOPIC TAGS: evaporation, surface active agent, thermodynamic law, adsorption

ABSTRACT: In earlier work by the authors, the effect of surface-active substances on the evaporation of water droplets was studied. The relations between the length of the time of evaporation and the radius of the droplets that followed from the experimental data indicated that evaporation was slowed down by the presence of the surface-active agents. The nature of these relations (expressed by curves with an inflection showing a decrease in the rate of evaporation after a certain time) was consistent with the assumption that as a result of the increase of the concentration of the surface active agent in the adsorption layer and a change in the structure in this layer there was either a reduction of the coefficient of condensation or an increase in the resistance to diffusion in the layer. The interpretation given by the authors to the phenomena observed did not conflict with present-day theories concerning the effect of monolayers on evaporation or with the laws of thermodynamics. Orig. art. has: 1 figure and 4 formulas. [JPRS: 36,455]

SUB CODE: 07 / SUBM DATE: 04Mar65 / ORIG REF: 002 / OTH REF: 001

Card 1/1 UDC: 541.18:533

DUKHIN, YE. YE.

ITSKOVICH, M.L., inzhener; DUKHIN, Ye.Ye., inzhener.

Sight shafts made of asbestos cement pipes. Nov.tekh.i pered. op. v stroi. 19 no.2:24 F '57. (MIRA 10:4)
(Pipe, Asbestos-Cement) (Sewerage)

DUKHINA, M.A.

Change in the fundus oculi picture in patients with hypertension when treated with Rauwolfia serpentina preparations and ganglionic blocking agents. Oft. zhur. 18 no.1:26-31 '63 (MIRA 17:4)

1. Iz otdela klinicheskoy farmakologii i funktsional'noy terapii Ukrainskogo nauchno-issledovatel'skogo instituta klinicheskoy meditsiny imeni akademika N.D. Strazhesko.

OSTRIKOV, S.M.; DUKHINA, T.P.; LEVI, S.M.

Investigating the mechanism of hardening. Part 2: Studying the shrinkage stresses in drying gelatin and triacetate films. Zhur.nauch. i prikl. fot. i kin. 9 no.4:259-261 Jl-Ag '64. (MIRA 17:10)

1. Vsesoyuznyy nauchno-issledovatel'skiy kinofotoinstitut (NIKFI) i Rostovskiy gosudarstvennyy universitet.

OSTRIKOV, M.S.; DUKHNINA, T.P.; VLODAVETS, I.N.; SINITSYNA, G.M.

Capillary contraction of drying condensation structures of polyvinyl formal. Part 1: Effect of the time of acetalation. Koll. zhur. 26 no.5:600-607 S-O '64. (MIRA 17:10)

1. Rostovskiy universitet, kafedra fizicheskoy i kolloidnoy khimii i Institut fizicheskoy khimii AN SSSR, Moskva.

KREMNEV, Oleg Aleksandrovich, doktor tekhn. nauk; BOROVSKIY, Vladimir Rudol'fovich, kand. tekhn. nauk; DOLINSKIY, Anatoliy Andreyevich, kand. tekhn. nauk. Prinimali uchastiye: PIYEVSKIY, I.M.; DUKHNENKO, N.T.; SHELIMANOV, V.A.; CHERNOBYL'SKIY, I.I., doktor tekhn.nauk, retsenzent; GAVRILOV, V.N., red.izd-va; ROZUM, T.I., tekhn. red.

[High-speed drying] Skorostnaia sushka. Kiev. Gostekhizdat USSR, 1963. 381 p. (MIRA 17:2)

BOROVSKIY, V.R. [Borovs'kyi, V.R.]; DUKHNENKO, N.T. [Dukhnenko, M.T.]

Effect of the form of the boundary layer on the heat emission of small cylindrical bodies in an air stream. Dop. AN URSR no.2:207-210 '65. (MIRA 18:2)

1. Institut tekhnicheskoy teplofiziki AN UkrSSR.

ASHERSON, M. (Fergana); ALEKSEYEVA, M.; ZAMKOVSKIY, V., liteyshchik; BYKOVA, V. (Kiyev); ZUBKO, A.; DUKHNEVICH, B. (Vil'nyus)

On good people. Sov. profsoiuzy 19 no.11:19 Je '63. (MIRA 16:8)

1. Literaturnyy sotrudnik mnogotirazhnoy gazety fabriki "Skorokhod", Leningrad (for Alekseyeva). 2. Mekhanicheskiy zavod "Santekhprom", Simferopol' (for Zamkovskiy). 3. Nachal'nik otdeleniya Gosudarstvennoy avtomobil'noy inspektsii Sovetskogo rayona, Kuybyshev (for Zubko). (Trade unions—Officers)

DUKHNIN, V.M.; SENKEVICH, N.V.

Balancing the rotors of GT-700-4 gas-turbine units. Gaz. delo no.12:
18-23 '63. (MIRA 17:10)

1. Moskovskoye upravleniye magistral'nykh gazoprovodov.

L 6407-66 EWT(d)/EWT(m)/EWP(f)/T-2/EWA(c) WE

ACC NR: AP5026823

SOURCE

Kogaher, V. ... Mal'tsev,

... system for internal-combustion ... No. 174468 ... by the Central Scientific-Research ...

... otkrytiya, izobreteniya i tovarnyye znaki ...

TOPIC TAGS: internal combustion engine, fuel dispersant, fuel injection, fuel injector, engine fuel system

ABSTRACT: An Author Certificate has been issued for a fuel-injection system (see Fig. 1) for internal-combustion engines, which contains plunger-pump sections, suction lines connected to a fuel tank or booster pump, ... lines connected to ... electromagnetic metering devices, and an electronic ... unit. For improved uniformity and accuracy in distributing fuel under all engine operating conditions, the electromagnetic metering devices are ... in the suction lines

Card 1/2

UDC: 621.43.038.3

L 6407-66

ACC NR: AP5026823

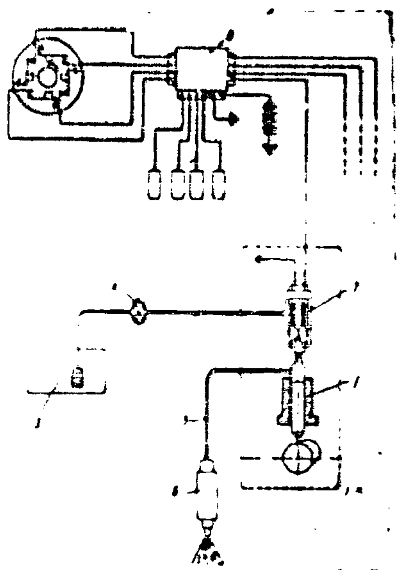

Fig. 1. Fuel-injection system

1 - Plunger-pump section, 2 - suction line; 3 - fuel tank, 4 - booster pump; 5 - injection line, 6 - nozzle, 7 - electromagnetic metering device, 8 - electronic control unit

of the plunger-pump sections. These devices provide for fuel metering at low pressures. Orig. art. has: 1 figure. [LB]

SUB CODE: PR, GO/ SUBM DATE: 18Jul64/ ATD PRESS: 4181

Card 2/2

NIKOLAYEVA, V.G.; DUKHNINA, A.Ya.; KOMAROV, B.I.; LEVINSON, G.I.; Prinimali uchastiye: KOLOTUSHKINA, Ye.V., inzh.; BORISKINA, N.A.

Investigation of the anticorrosive additives to residual fuels containing vanadium and sulfur. Khim. i tekh. topl. i masel. 6 no.10:17-22 O '61. (MIRA 14:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut po pererabotke nefti i gaza i polucheniyu iskusstvennogo zhidkogo topliva.
(Fuel—Additives) (Corrosion and anticorrosives)

34616
S/065/62/000/003/002/004
E075/E135

11.0132

AUTHORS: Nikolayeva, V.G., Dukhnina, A.Ya., Korobov, B.F., Maslova, O.I., Levinson, G.I., and Perchenko, A.A.

TITLE: Preparation of gas-turbine fuels from coking distillates

PERIODICAL: Khimiya i tekhnologiya topliv i masel, no.3, 1962, 20-22

TEXT: One of the objects of the authors' work was to obtain gas-turbine fuels from the coking distillates. Conditions for the preparation of the experimental samples of the fuels from coking distillates were developed by VNII NP. The samples were prepared by the method of contact coking and the method of retarded coking. The raw material for the samples was a cracking residue from sulphur containing crudes. The vanadium content of the fuels was less than 0.001%, sulphur content about 2.5%, ash not more than 0.01%. The fuels were subjected to thermal stability testing at 150 °C for 6 hours with the circulation of air at the rate of 3 ℓ/hour for 100 g of fuel. The fuels were also heated at 60 °C for 300 hours. After the testing the

Card 1/2

APPROVED FOR RELEASE: Thursday, July 27, 2000 CIA-RDP86-00513R00041151(

density of the fuels increased slightly; the temperature of solidification increased markedly after the testing at 150 °C and less markedly after the storage tests at 60 °C. The viscosity of the fuels increased considerably and so did the time of filtration and precipitate on the filter. There were also small increases in the coking residue, asphaltene and carboid content of the fuels. Testing in bench-gas-turbine engines carried out under the direction of Engineer L.M. Nayman demonstrated that the combustion of the fuels proceeds satisfactorily.
There are 2 tables.

ASSOCIATION: VNII NP

APPROVED FOR RELEASE: Thursday, July 27, 2000 CIA-RDP86-00513R00041151(

S/262/62/000/011/015/030
I007/I252

AUTHORS: Nikolayeva, V. G., Dukhina, A. Ya., Komarov, B. I. and Levinson, G. I.

TITLE: Data on the use of anticorrosive additives to vanadium- and sulfur-containing heavy (residual) fuels

PERIODICAL: Referativnyy zhurnal, otdel'nyy vypusk. 42. Silovyye udtanovki, no. 11, 1962, 39, abstract 42.11.189. (In Collection Prisadki k maslam i toplivam, M., Gostoptekhizdat, 1961, 374-380)

TEXT: Laboratory test results are reported on the corrosive action of ash from various oil grades of Eastern oil fields, as well as on the influence of additives containing magnesium, silicon and aluminum. Tests on ЭИ-481 (EI-481); ЭИ-417 (EI-417) and ЭИ-607 (EI-607) steels showed after 10 hrs, metal losses of 1.92, 0.66 and 0.35% respectively. Data are given on the corrosion of steels in a gas stream. There are 2 figures and 3 tables.

/13

[Abstracter's note: Complete translation.]

Card 1/1

DUKHINA, B.S.

SHCHERPKOVSKAYA, Ye.V., kandidat meditsinskikh nauk. (Khar'kov); GEKHTMAN, M.Ya. (Khar'kov); VOLOVIK, S.S. (Khar'kov); LINKOVA, F.V. (Khar'kov); SOKOL'SKIY, S.L., kandidat meditsinskikh nauk. (Khar'kov); DUKHINA, B.S. (Khar'kov); MARKUS, L.M. (Khar'kov)

New effective method for the compound treatment of tabetic atrophy of the optic nerves. Vrach. delo no.1:89 Ja '57 (MLRA 10:4)

1. Ukrainskiy nauchno-issledovatel'skiy kozhno-venerolgoicheskiy institut.
(OPTIC NERVE--DISEASES) (NERVOUS SYSTEM--SYPHILIS)

DUKHINA, I. S.

PA 18/49T75

USSR/Medicine - Syphilis, Therapy May/Jun 48
Medicine - Arsenic and Arsenic Compounds

"Arsenotherapy of Syphilitics Who Have Suffered From Arsenic Complications," Prof L. M. Markus, I. S. Dukhina, Asst, V. G. Borovskaya, 5¼ pp

"Vest Venerol i Dermatol" No 3

Reports observations on 50 female syphilitics. Concludes that in majority of cases, exclusive of erythrodermia and hemorrhagic encephalitis, further arsenic-bismuth treatment of patients who have suffered from arsenic complications is possible. Slow injection of salvarsan preparations (8-10 minutes) is best prophylactic

18/49T75

USSR/Medicine - Syphilis, Therapy May/Jun 48
(Contd)

method against nitritoid reactions. Intermittent administration of arsenic often enables arsenotherapy to be continued and replacement of mapharsen with novarsenol enables preparation to be injected slowly, thus assisting the patient to tolerate it.

18/49T75

DUKHINA, I. S.

PA 18/49T80

USSR/Medicine - Syphilis, Therapy May/Jun 48
Medicine - Syphilis, Bismuth in

"Syphilis Therapy With New Bismuth Preparation, 'Biiodide Thiourea,'" I. S. Dukhina, 4 pp

"Vest Venerol i Dermatol" No 3 4 pp

Biiodide Thiourea was synthesized by B. Yu. Yasnitskiy (Editor hopes this complicated name will be replaced by a simpler one). It is a fine crystalline, odorless carmine-colored powder, a molecular compound of bismuth iodide and urea. Empirical formula, $CSN_2H_4BiS_3$. Bismuth content, 33-34%. Tests show it is an

[redacted] 18/49T80

USSR/Medicine - Syphilis, Therapy (Contd) May/Jun 48

effective spirocheticide and does not irritate the kidneys to any great extent. Recommended for treatment of syphilis.

[redacted] 18/49T80

CM
DUKHINA, I.S.

1111

Elimination of bismuth by urine in patients treated with diiodothiourea. I. S. Dukhina. Vestnik Venerol. i Dermatol. 1950, No. 1, 15-19. Intramuscular injection of 1 ml. (0.0[illegible] g. Bi) of the drug soln. in syphilitics, followed by 2 ml. 3 times a week (35 ml. total) leads to continued urinary elimination of Bi, highest in 5th week; av. value was 4.72 mg. daily. When Bioquinol was used as the drug the av. elimination was 4.78 mg. G. M. Kosolapoff

DUKHINA, M.A.

EXCERPTA MEDICA Sec.12 Vo.11/6 Ophthalmology June 57

917. DUKHINA M. A. Dept. of Dis. of the Eye, Med. Stomatol. Inst., Kiev. *Intraocular pressure in experimental lesions of the cerebral cortex (Russian text) OFTAL. Z. 1956, 3 (136-141) Tables 2

The intraocular pressure was studied over long periods of time during which the pressure on the brain and its meninges was increasing. An artificial model of a growing extradural 'tumour' (described in the journal Vop. Nejrokhir. 1952, 6) was employed in the experiments. The control group consisted of 10 rabbits. Tonometry and elasto-tonometry were carried out during a period of 10 days. The intraocular pressure was found not to exceed 27 mm. of mercury, and the elasto-curve was a regularly rising straight line with a rise of 7-13 mm. mercury. The 2nd group consisted of 10 rabbits submitted to the operation. Nine of these (experimental) rabbits received a total of 61 injections of a contrasting medium, one every 2-3 days. Immediately after the introduction of the contrasting medium, the elasto-curve remained normal in type, and a small rise in intraocular pressure was observed in only 3 out of 35 estimations. On the day following the introduction of the contrasting medium, an increase in intraocular pressure, up to 32-35 mm., and sometimes even to 45 mm. mercury, was regularly noted, with a break in the elasto-curve, on the side of the operation, and its lower rise. On the 3rd or 4th day the intraocular pressure returned to its initial value. The author considers neurovascular mechanisms to be responsible for disturbances of regulation of the intraocular pressure on the side of the (surgical) interference. As the pressure on the brain increased and intracranial hypertension developed (after the 6th or 7th introduction of the contrasting medium), there was no increase in intraocular pressure; the author explains this by an inhibition of cortical functions, under the influence of the above factors. Bibliography: 19 titles. Kulikova - Moscow

DUKHMOVA, M.M.

PROCESSES AND PROPERTIES INDEX

Ca

7

Colorimetric determination of nitrate with β-methyl-
umbelliferone. A. S. Vasil'ev and M. M. Dukhmova
Zavodskaya Lab. 10, 35-7(1941).—Place 0.3 ml. of the
sample in a 10-ml. pycnometer, add 0.6 ml. of β-methyl-
umbelliferone, and mix thoroughly. Select the nearest
standard and repeat the same operations. Place both
pycnometers in a thermostat at 100° for 3-5 min. or in a
... of hot water, remove the pycnometers, dil. the con-
tents with water and neutralize carefully with 25% NH_3 to
a basic reaction. The amt. of NH_3 added to each pycnome-
ter should be the same. Dil. the contents to the mark
with water, transfer to cylinders of a Dubosq colorimeter
and compare. The lemon-yellow coloration obtained is
stable and is retained unchanged for several weeks. The
coloration follows the Lambert-Beer law. The procedure
requires 15 min. and may be used to det. up to 0.5 γ to
within ±1%. For small concns. of nitrate the liquid layer
should be 20-30 ml. high and for large concns. 10-20 ml.
By the addn. of 0.5 ml. of 0.02% safranine per 10 ml. of
soln. the yellow color is changed to yellow-pink, which
facilitates visual evaluation of the color. The coloration
of the safranine remained stable for days. Instead of
adding an outside reagent various light filters were tested.
Best results were obtained with 20% $CuSO_4$ soln.

R. Z. Kamich

ASD-SLA METALLURGICAL LITERATURE CLASSIFICATION

EDEL'SHTEYN, Il'ya Vladimirovich; ~~DUKHLIY, Vasiliy Alekseyevich~~; LEVIN, Moisey Solomonovich; RYABENKO, A.I., red.; GULENKO, O.I. [Hulenko, O.I.], tekhn. red.

[Financing and issuing credit to agricultural enterprises] Finansirovanie i kreditovanie sel'skokhoziaistvennykh predpriiatii. Kiev, Gossel'khozizdat USSR, 1962. 347 p. (MIRA 16:2)

(Agriculture—Finance)

24.5200 (

66690

SOV/21-59-12-5/20

AUTHORS: Kremn'ov, O.O. and Dukhnenko, M.T.

TITLE: Heat Losses in Small Cylindrical Bodies in a Transverse Air Flow

PERIODICAL: Dopovidi Akademiyi nauk Ukrayins'koyi RSR, 1959, Nr 12, pp 1316-1321 (USSR)

ABSTRACT: This is an account of a study of heat transfer in single copper wires and in packets of wires in a transverse air current. The high coefficients of heat transfer in single thin wires and in packets of such wires, obtained by the authors confirm the possibility of a considerable intensification of heat transfer in revolving regenerators and other industrial heat transfer equipment, by means of superimposing a layer of thin wires upon their ribbed surfaces. At a tenfold reduction of wire diameter (from 1.0 to 0.1 mm) the heat transfer coefficient increased more than 10 times, which is assumed to the result of an additional effect of a drop in the thermal resistance of the boundary layer of a cylindrical form. The magnitude of this effect declined with an increase of wire

Card 1/4

66690

SOV/21-59-12-5/20

Heat Losses in Small Cylindrical Bodies in a Transverse Air Flow

diameter. The heat transfer coefficient of a packet of wires was found to be 25% lesser than that of single wires of equal diameter. Dependence of the heat transfer coefficient upon wire diameter and air flow velocity is shown in Figure 2. The boundary layer was determined by the formula

$$\delta = \frac{d}{cRe^n}.$$

Experiments were conducted in a special experimental stand shown in Figure 1, which included a non-return flow wind tunnel 200x50 mm. Copper wires used in experiments included insulated 0.02, 0.05, 0.1, 0.115 mm wires and bare 0.2, 0.5 and 1.0 mm wires. Wire packets were made of 0.115 mm wires: one package consisted of 90 corridor rows of wire in depth and 19 rows in width, with spacing between rows in depth being 1.0 mm and in width 1.75 mm; the other package

Card 2/4

4

66690

SOV/21-59-12-5/20

Heat Losses in Small Cylindrical Bodies in a Transverse Air Flow

consisted of 42 wire rows in depth and 100 rows in width, with a spacing being 0.5 mm. Wires were heated with the direct current. Air flow velocity was measured by a Prandtl tube and an "Askaniya" micromanometer. Results were processed by a method of smallest squares described by A. Worsing and Dzh. Heffner [Ref 4]. A maximum specific error in experiments with single wires made up 6.6%, with packets 8.2%. Temperature of air current used in experiments with single wires was changed from 14.6 to 26.1° C, velocity of air current was changed from 4.8 to 26.4 m/sec. Temperature of single wires was changed from 22.8 to 112.4° C. Temperature of air current applied to wire packets was changed from 20.3 to 23.4° C; velocity of air current was changed from 3.47 to 20.5 m/sec; temperature of packets was changed from 32.2 to 83.5° C. There are 1 diagram, 3 graphs, 2 tables and 6 references, 4 of which are Soviet, 1 German and

Card 3/4

4

66690

SOV/21-59-12-5/20

Heat Losses in Small Cylindrical Bodies in a Transverse Air Flow

1 English.

ASSOCIATION: Instytut teploenerhetyky AN URSR (Institute of Thermal Power Engineering of the AS UkrSSR)

PRESENTED: By I.T. Shvets', Member, AS UkrSSR

4

SUBMITTED: April 29, 1959

Card 4/4

10.3500

18.8100

27057

S/021/60/000/005/013/015
D210/D304

AUTHORS: Krema'ov, O.O., Dukhnenko, M.T.

TITLE: Heat loss of thin strips of small dimensions in a transverse air stream

PERIODICAL: Akademiya nauk ukrayins'koyi RSR. Dopovidi, no. 5, 1960, 642-645

TEXT: Since the boundary layer becomes larger when the length of the strip in the direction of air stream increases, the process of heat exchange can be intensified by diminishing the width of the strip. To study the heat loss of such strips, the authors investigated strips of beryllium bronze 0.1 mm thick: 0.52, 2.0, 5.0 and 10 mm wide, without slits and strips 0.1 mm thick and 10 mm wide with slits of 1, 2, 3 mm. Maximum relative error was 6.5%. The temperature of streaming air was varied between 16.1 and 25.9° C, that of strip between 23.2 and 116.0° C, the velocity of air stream between 4.8 and 27.0 m/sec. The dependence of the coefficient of heat loss on the velocity of air

Card 1/4

27057
S/021/60/000/005/013/015
D210/D304

Heat loss of thin ...

stream is shown in Table 1. The graph of the function Nu = f(Re) in logarithmic coordinates according to the experimental data agrees with the equation $Nu = 0.42\ Re^{0.55}$ when the Reynolds number varies between 150 and 10,000. To determine optimum distance between strips in heat exchange, experiments on strips with slits were carried out, with temperature of air stream between 17.5 and 19.9° C, that of strip between 27.7 and 114.2° C and the velocity of air stream between 5.14 and 27.8 m/sec. The dependence of the coefficient of heat loss on velocity of air stream is shown in Table 2, according to which the coefficient of heat loss of strips with slit exceeds that of strips without slit by more than 50% but change of dimensions of slits between 1 and 3 mm does not affect the coefficient practically. There are 3 figures, 2 tables and 1 Soviet-bloc reference.

ASSOCIATION: Instytut teploenerhetyky AN URSR (Institute of Heat Power Engineering AS UkrSSR)

Card 2/4

KREMNEV, O.A. [Kremn'ov, O.O.]; DUKHNENKO, N.T. [Dukhnenko, M.T.]

Heat loss of thin strips of small dimensions in a transverse stream of air. Dop.AN URSR no.5:642-645 '60. (MIRA 13:7)

1. Institut teploenergetiki AN USSR. Predstavleno akademikom AN USSR I.T.Shvets [I.T.Shvets'].
(Heat--Radiation and absorption)

DUKHNENKO, N.T. [Dukhnenko, M.T.]

Heat transfer by small elements in a lateral gas flow. Zbir.prats' Inst. tepl.AN URSR no.18:97-106 '60. (MIRA 14:12)

(Heat—Radiation and absorption)

ISKHAKOV, G.Kh.; TROITSKIY, D.P., otv.red.; DUKHNEVICH, V.L., otv.red.

[Some economic aspects of metallurgical furnace repair]
Nekotorye voprosy ekonomiki remonta metallurgicheskikh pechei.
Sverdlovsk, Akad.nauk SSSR, 1958. 70 p. (MIRA 12:8)
(Metallurgical furnaces--Maintenance and repair)

DUKHNEVICH, Vadim Ignat'yevich; ISKHAKOV, Ganim Khanipovich; PANFILOV, Mikhail Ivanovich; SHVEDTSOV, Vasiliy Petrovich; GAL'PERIN, A.S., insh., retsenzent; VESELOV, N.G., dotsent, kand.ekonom.nauk, red.; SYRCHINA, M.M., red.izd-va; MATLYUK, R.M., tekhn.red.

[Economic aspects and the organization of open-hearth furnace repairs] Voprosy ekonomiki i organizatsii remontov martenovskikh pechei. Sverdlovsk, Gos.nauchno-tekhn.izd-vo lit-ry po chernoi i tsvetnoi metallurgii, Sverdlovskoe otd-nie, 1960. 95 p. (MIRA 13:9)

(Open-hearth furnaces--Maintenance and repair)

OSINTSEV, A.S., doktor ekon.nauk; DUKHNEVICH, V.I., inzh.

"Economy of ferrous metals" by L.L. Zusman. Reviewed by A.S.Osintsev, V.I. Dukhnevich. Stal' 20 no.9:860-861 S '60. (MIRA 13:9)
(Metalwork--Accounting) (Iron) (Steel)
(Zusman, L.L.)

DUKHNEVICH, Vadim Ignat'yevich; KONOVALOV, Leopol'd Anatol'yevich; SKOROKHODOV, A.A., retsenzent; RADUKIN, V.P., red.; SYRCHINA, M.M., red. izd-va; MAL'KOVA, N.T., tekhn. red.

[Steel costs]Sebestoimost' stali. Sverdlovsk, Metallurgizdat, 1962. 57 p. (MIRA 15:7)
(Steel—Costs)

NIKOLAYEVA, V.O.; DUKHNINA, A.Ya.; POPOVA, N.M.; BAYEVICH, Yu.A.;
SAMGIN, I.B.; ~~PERONENKO~~, A.A.; LEVINSON, G.I.

Carbamide dewaxing of oil fractions. Trudy VNII NP no.7:253-263 '58. (MIRA 12:10)

(Paraffins) (Urea)

S/081/61/000/020/084/089
B110/B147

AUTHORS: Nikolayev, V. G., Korobov, B. F., Dukhnina, A. Ya.

TITLE: Problem of producing liquid fuel for gas-turbine plants

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 20, 1961, 409-410, abstract 20M148 ([Tr.] Groznensk. neft. in-t, sb. 23, 1960, 53-64).

TEXT: The results of a study on the production of inexpensive mass products of liquid fuel for gas-turbine plants are presented. [Abstracter's note: Complete translation.]

Card 1/1